An INL research team was recently recognized for their analysis and model validation that could help improve operations at geothermal energy plants in California and Nevada.

Idaho researchers receive Geothermal Energy Association Honors for 2014

By Keith Arterburn, *INL Communications & Governmental Affairs*

Researchers at the U.S. Department of Energy's Idaho National Laboratory received special recognition during the August 2014 National Geothermal Summit in Reno, Nevada, for data analysis and geothermal model validation.

INL geothermal research interns Hillary Hanson and Rachel Wood, along with their mentor, Greg Mines, received a Special Recognition Award for "their outstanding achievement in the geothermal industry." The INL researchers analyzed data provided on geothermal operations in California and Nevada.

Concerned about recorded declines in power production from geothermal plants and the need for future sustainable operations, the Department of Energy Geothermal Technologies Office asked for a review of the power data from California and Nevada geothermal plants. The Nevada Bureau of Mines and Geology provided data from the start of each plant's operation through 2009. Several factors were examined, including decreasing temperatures of geothermal sources, lower net power delivered to the grid, and declining capacity for measuring plant efficiency.

"We learned that the geothermal power available to the electrical grid is declining," Hanson said. "The challenge now is to develop methods to produce higher power availability and maintain that for longer periods of time."

Left to right: INL mentor Greg Mines, Rachel Wood, Hillary Hanson and DOE Geothermal Technologies Office Chief Engineer Jay Nathwani.

The study examined flow rates, which may have been increased in order to maintain as much power to the grid as possible. Future analysis is needed in order to determine solid relationships between grid power sales and changes in geothermal production temperatures and flow.

The analysis also reviewed factors contributing to declines in capacity, or the efficient operations of the geothermal plants. Capacity is the amount of electricity generated compared to the maximum amount with continuous generation at full power.

"The data suggested that there were four contributors to the observed capacity factor decline, including reduced generation, idle periods, added generation capacity without increased production and under-performing new plants," Wood said.

"Both Hillary Hanson and Rachel Wood did an excellent analysis of the geothermal operational data provided and have raised some interesting questions that the geothermal community will need to investigate further," Mines said. "There continues to be challenges in refining the science and engineering behind geothermal operations."

The analyses were given to DOE and will be included among presentations at the Geothermal Resources Council to be held this fall, Hanson said.

Doug Hollett, director of the Geothermal Technologies Office, represented DOE and congratulated Wood and Hanson on earning recognition for their analytical performances.

Wood and Hanson used Google Earth to create this map of power plants included in the study.

The Geothermal Energy Association (GEA) is a trade association composed of U.S. companies supporting the expanded use of geothermal energy and developing geothermal resources worldwide for electrical power generation and direct-heat uses. GEA advocates for public policies that will promote the development and utilization of geothermal resources, provides a forum for the industry to discuss issues and problems, encourages research and development to improve geothermal technologies, presents industry views to governmental organizations, provides assistance for the export of geothermal goods and services, compiles statistical data about the geothermal industry, and conducts education and outreach projects.

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